

# (12) UK Patent Application (19) GB (11) 2 377 167 (13) A

(43) Date of A Publication 08.01.2003

(21) Application No 0116347.6

(22) Date of Filing 04.07.2001

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(51) INT CL<sup>7</sup>  
A46B 9/04

(52) UK CL (Edition V )  
A4K KCA  
U1S S1125

(56) Documents Cited  
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(58) Field of Search  
UK CL (Edition T ) A4K KBC KCA  
INT CL<sup>7</sup> A46B 9/00 9/04  
Other: Online: WPI, EPODOC, JAPIO

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(74) continued overleaf

(54) Abstract Title  
**Toothbrush**

(57) A toothbrush has a head 1, which comprises an upper 1a and a lower 1b bristles holder, and a handle 2. The arrangement of bristles may follow the contour of the holders so that, in use, when the head 1 is placed between the teeth of the upper and lower jaws, the bristles 3a and 3b may surround and accommodate opposite groups of teeth simultaneously. Bristles holders may be interconnected via holes 5. The bristles holders may be attached to two separate heads joined to a handle by two or more flexible or rigid members. The bristles holders may also be arranged to face each other so that in use the bristles may contact the front and back side of the brushed teeth simultaneously in either the upper or lower jaw. Bristles holders may also be attached to four separate heads attached to a handle by four or more flexible or rigid members.

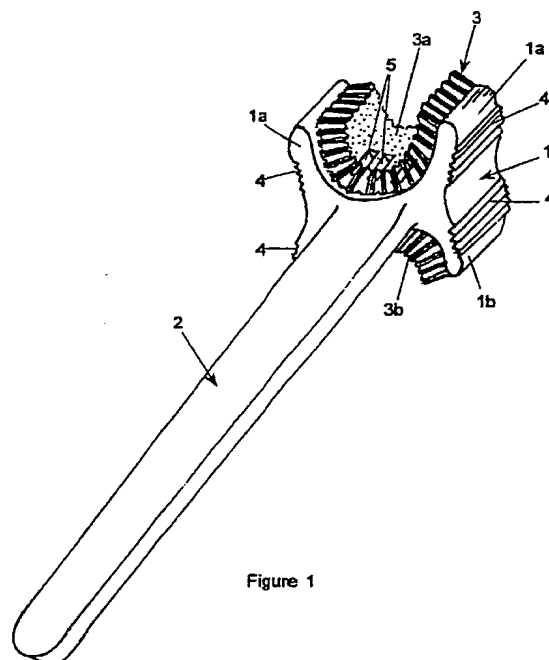


Figure 1

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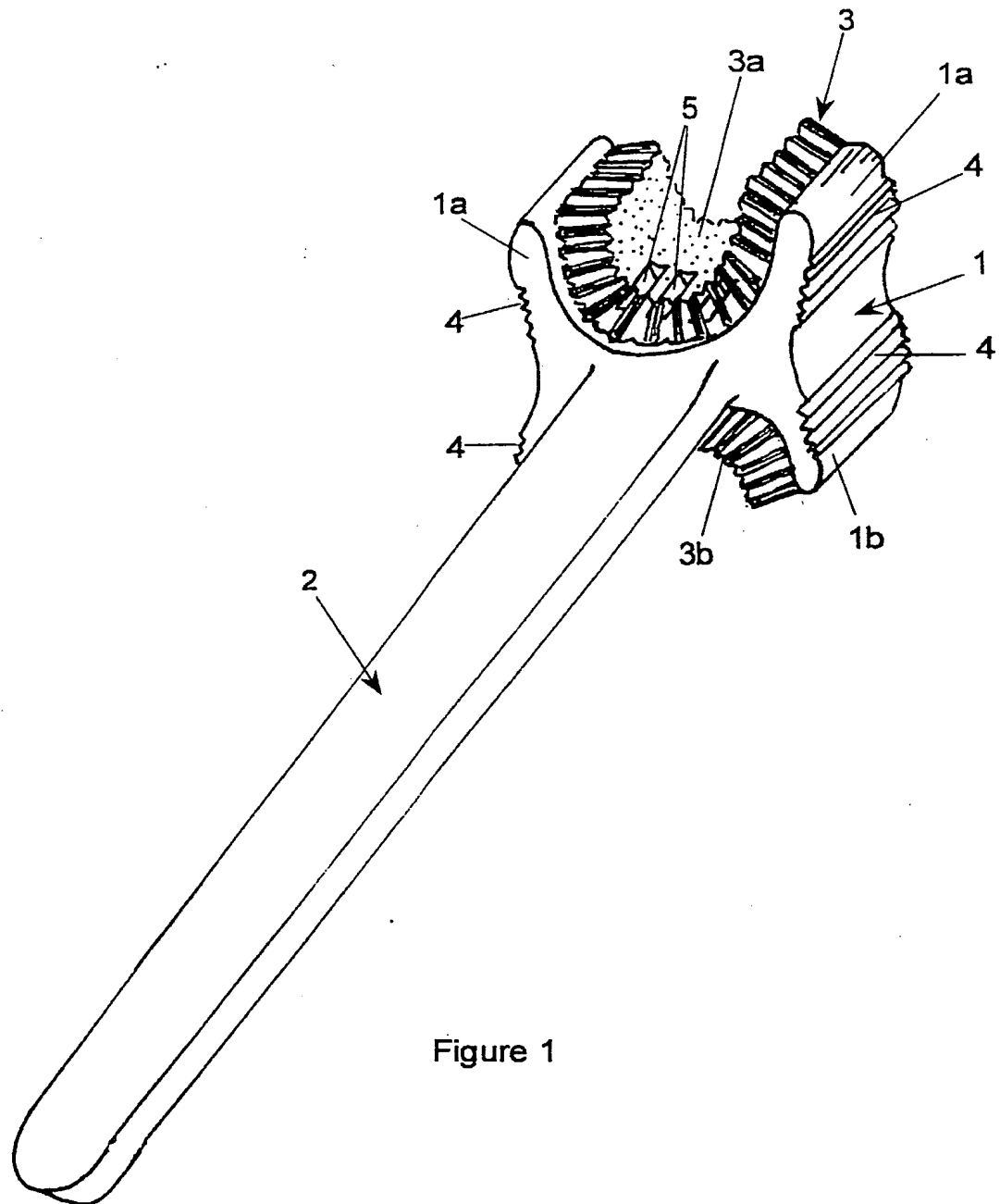


Figure 1

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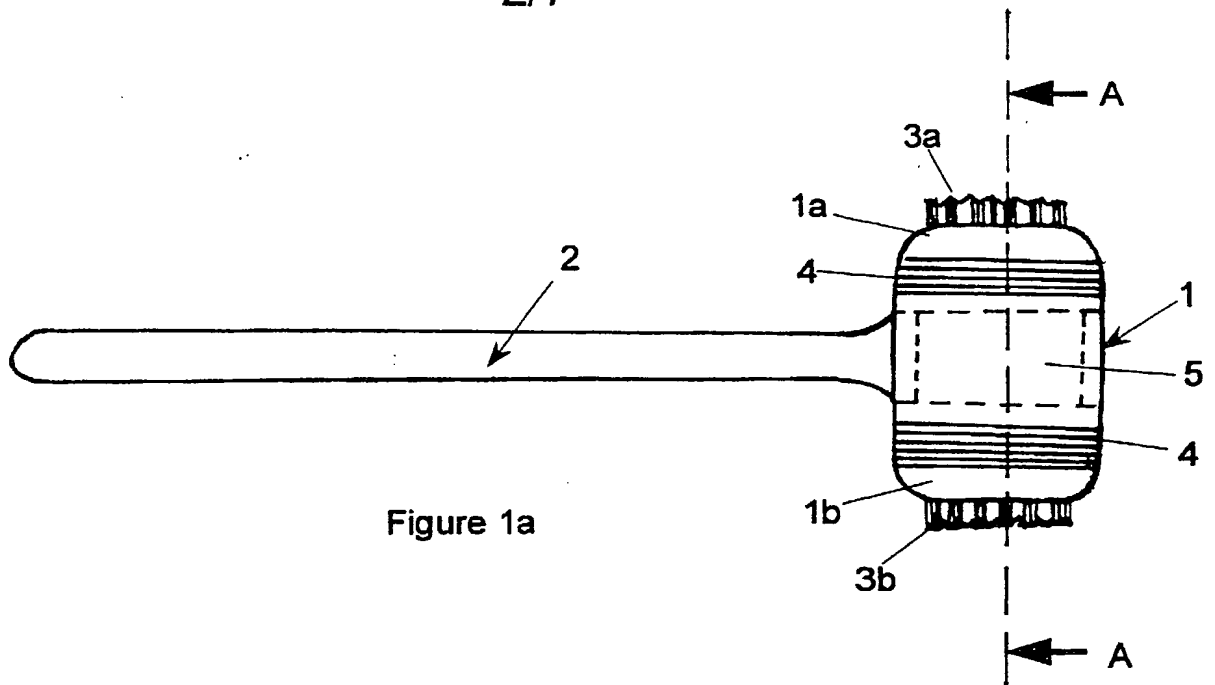


Figure 1a

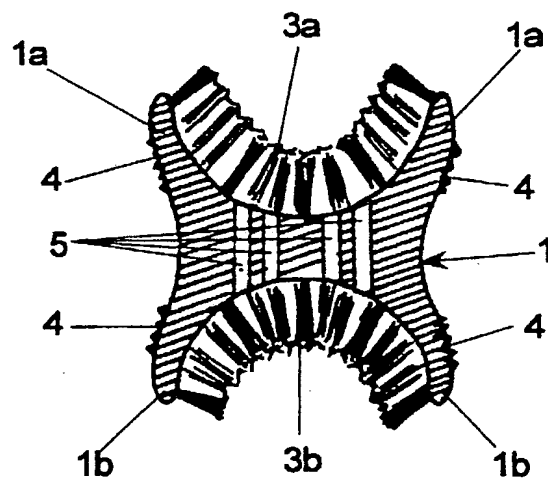
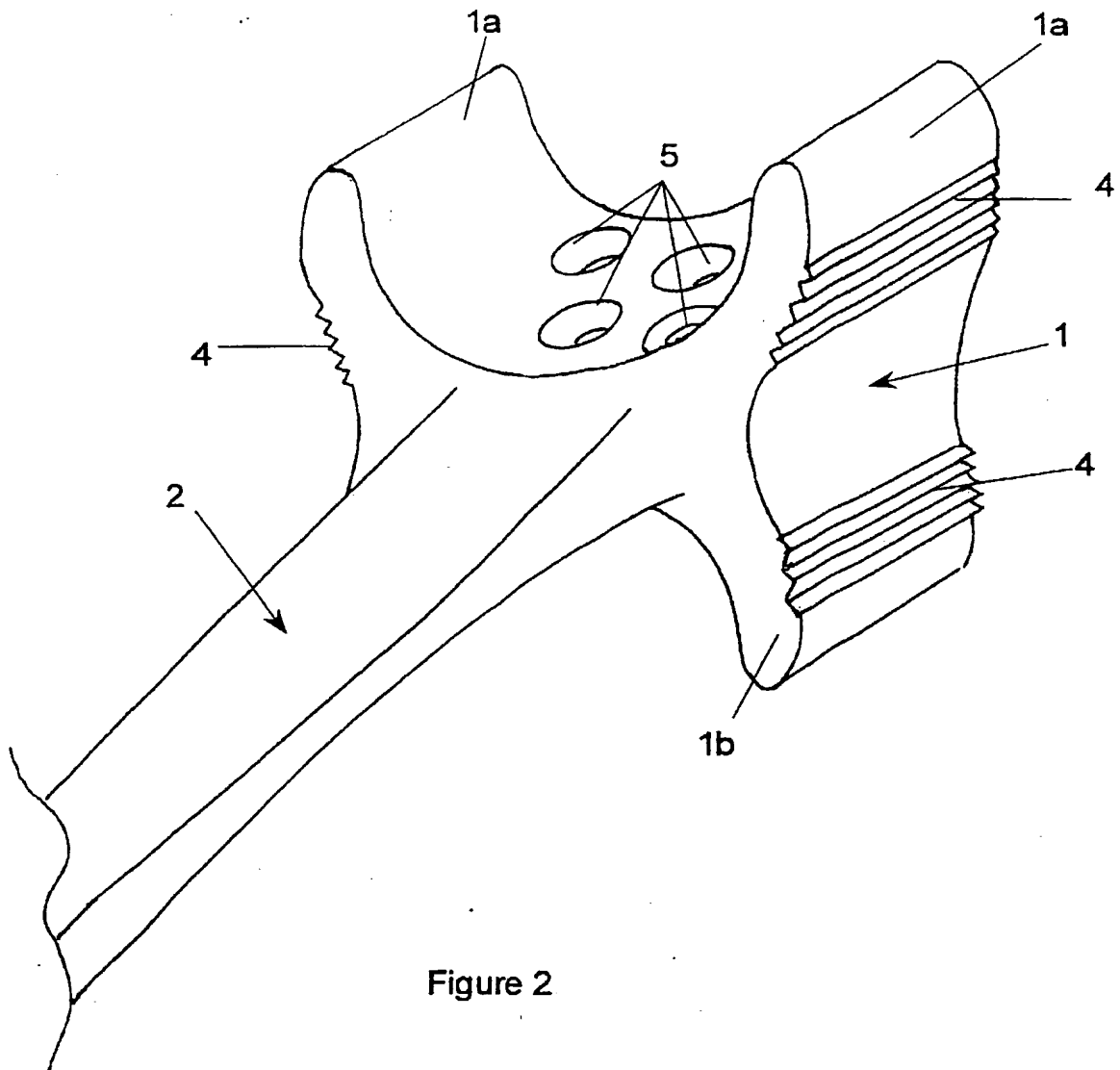


Figure 1b

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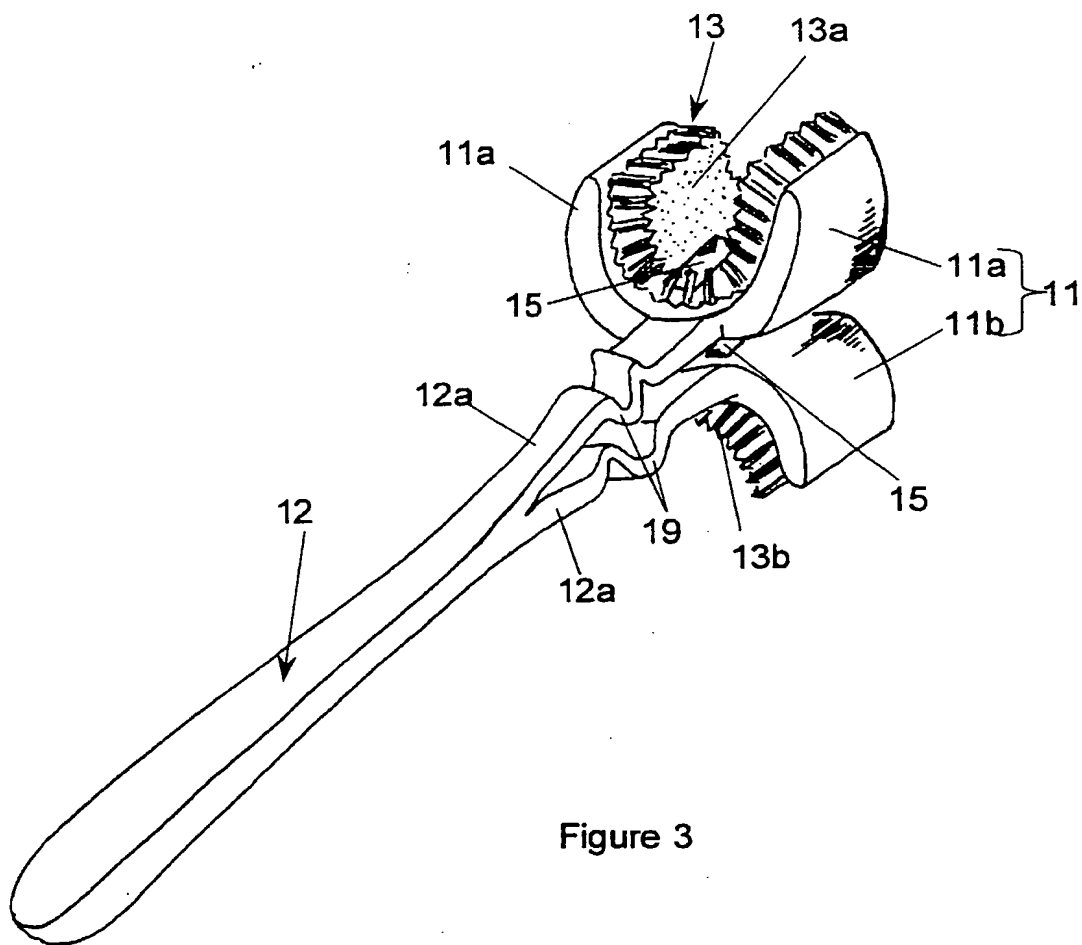


Figure 3

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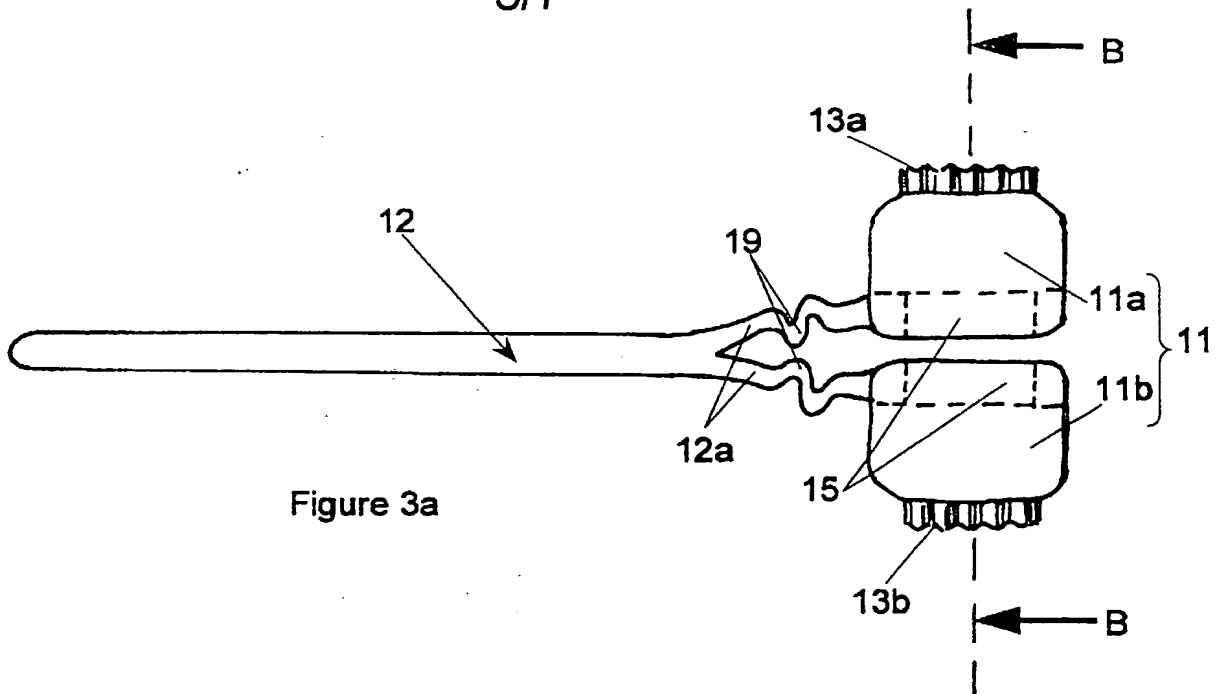


Figure 3a

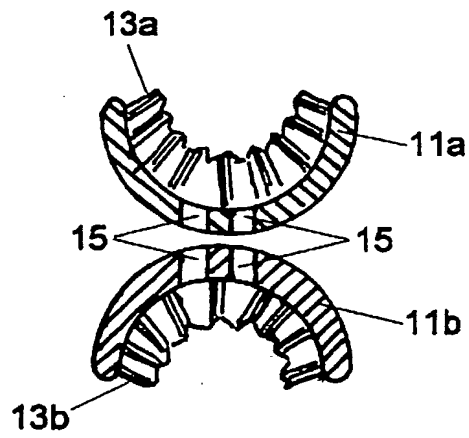


Figure 3b

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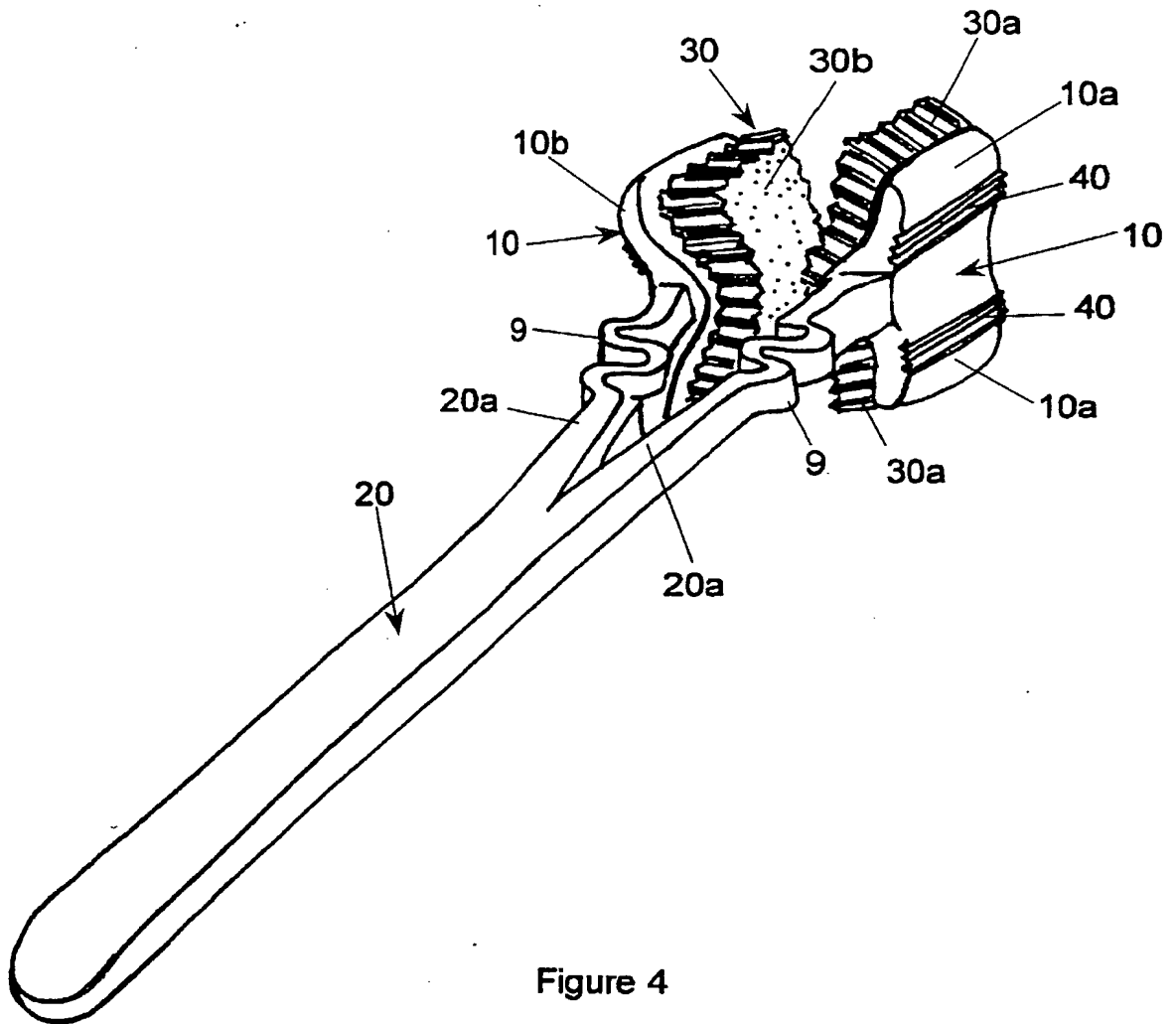


Figure 4



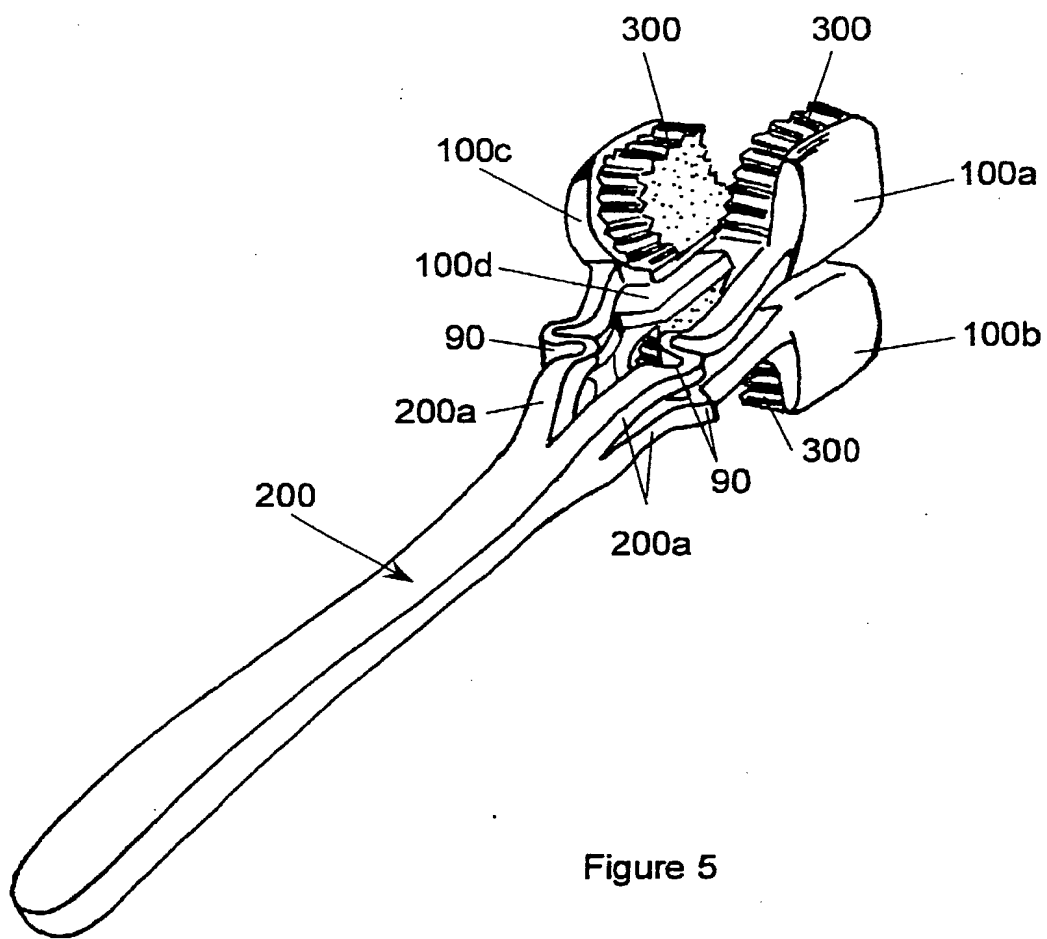


Figure 5

## TOOTHBRUSH

This invention relates to a toothbrush.

Such toothbrushes are well known, but suffer from the disadvantage that, they can not brush more than one surface or more than one side of the teeth simultaneously, and when they are used for the cleaning of the back surface of the tooth and the interface between that surface and the gum, it is difficult to reach the entire surface from the inside of the mouth. Accordingly, dental plaque may be deposited and built up at the back surface of the tooth, due to inefficient cleaning, and may lead to tooth decay.

An object of this invention is to provide a toothbrush, which allows easy brushing and simultaneous access to the entire back and top surfaces of the brushed teeth, at both jaws, while brushing the front surfaces of these teeth.

Accordingly, this invention provides a toothbrush including a profiled brushing head arrangement connected to a handle directly or via two or more rigid or flexible members so that the brushing head arrangement flexes and springs forward, backward, upward, and downward, as a single joined structure or as separate individual segments and sections, while its bristles surround and accommodate the brushed teeth, of the upper and the lower jaw simultaneously, to brush their six surfaces (front, back, and top surfaces of lower jaw's teeth, and the three surfaces of the opposite teeth at the upper jaw) in one brushing action.

Preferably the handle and the brushing head arrangement of the brush are made of plastics material, but they may instead be made from rubber, wood, metal, ceramic, glass, or from a combination of these materials. To provide a soft touch for the handle and to incorporate flexible members between the handle and the brushing head and its sections, various grades of thermoplastic elastomers or rubber materials may be used in such members and segments. The bristles are made of thermoplastic polyamides (nylon), but they may instead be made of synthetic, natural fibres, or a combination of fibres.

A preferred embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 shows a perspective view of toothbrush embodying the invention;

Figure 1a is a side view of the toothbrush shown in figure1;

Figure 1b is a section along the line A-A of figure 1a,

Figure 2 is a magnified perspective view showing a brushing head arrangement (without bristles) of the toothbrush shown in figure1;

Figure 3 is a perspective view of another embodiment of the invention;

Figure 3a is a side view of the toothbrush shown in figure3;

Figure 3b is a section along the line B-B of figure 3a,

Figure 4 is a perspective view of a third embodiment of the invention; and

Figure 5 is a perspective view of a fourth embodiment of the invention.

As shown in Figure 1, the toothbrush of this embodiment of the present invention has a brushing head 1, which comprises an upper bristles holder 1a, and a lower bristles holder 1b, which are joined in one structure and have the same or different geometry and symmetry, and a handle 2. Arrangement of bristles 3 on the bristles holders 1a and 1b follows the contour of these holders so that the bristles 3a of the upper holder 1a surround and accommodate the brushed teeth at the upper jaw, while the bristles 3b of the lower holder 1b surround and accommodate the segment of the opposite teeth on the lower jaw, when the brushing head 1 is placed between the teeth of the upper and the lower jaw. Although the bristles 3a and 3b of the example shown in Figure 1 are arranged in continuous rows, it can be arranged in groups or isles of bristles of the same or different shape, type, and distribution, on each bristles holder 1a and 1b. The brushing head 1 may include flexible segments or flexible joints 4 to allow segments of the brushing head 1 to flex and spring in the required directions during the brushing. The upper bristles holder 1a and the lower bristles holder 1b are opened to each other via through-holes or through-slots 5, of any shape, number, and spacing, to allow water, toothpaste, or any other cleaning medium to pass between the two holders 1a and 1b, as shown in Figure 2 which shows the brushing head of this embodiment (bristles not shown to reveal details of the through-holes 5). Although the brushing head 1, of this embodiment, has a rectangular geometry of rounded edges, and tapered sides, as it is shown in Figure 1a which is a side view of the example given in Figure 1, it could have any other shape or geometry, and its bristles holders 1a and 1b, could have any configuration other than the semicircular, which is shown Figure 1b, which is a cross section along the line A-A of Figure 1a. Although the handle 2 of the example shown in Figure 1 of this embodiment has a

straight flat geometry, and forms an integral part with the brushing head 1, it could have any other shape, geometry, and form.

As shown in Figure 3, the toothbrush of the second embodiment of the present invention has a brushing head 11, which comprises an upper bristles holder 11a, and a lower bristles holder 11b, which are separated from each other, and may have the same or different geometry and symmetry, and a handle 12, which is connected to the brushing head segments, 11a and 11b, via two or more flexible or rigid members 12a. Arrangement of bristles 13, on the bristles holders 11a and 11b, follows the contour of these holders so that the bristles 13a of the upper holder 11a surround and accommodate the brushed teeth at the upper jaw, while the bristles 13b of the lower holder 11b surround and accommodate the segment of the opposite teeth on the lower jaw, when the brushing head 11 is placed between the teeth of the upper and the lower jaw. Although the bristles 13a and 13b, of the example shown in Figure 3, are arranged in continuous rows, it can be arranged in groups or isles of bristles of the same or different shape, type, and distribution, on each bristles holder 11a and 11b. As shown in Figure 3a, which is a side view of the example toothbrush shown in Figure 3 for this embodiment, and in Figure 3b, which is a cross section along the line B-B of Figure 3a, the upper bristles holder 11a and the lower bristles holder 11b include through-holes or through-slots 15, of any shape, number, and spacing, to allow water, toothpaste, or any other cleaning medium to pass between the two holders 11a and 11b, as shown in Figure 3a. Although the handle 12 of the example shown in Figure 3 of this embodiment has a straight flat geometry, and forms an integral part with the brushing head 11, it could have any other shape, geometry, and form.

The third embodiment of the present invention which is shown in Figure 4, comprises a brushing head arrangement 10, which has a right hand side bristles holder 10a, and a left hand side bristles holder 10b, of the same or different shape and symmetry, and a handle 20, which is connected to the bristles holders 10a and 10b via two or more members 20a, which may include a flexible structure or a flexible segment 9, to allow the brushing head arrangement 10 to flex and spring, as individual bristles holders or as a combined structure, in the required directions during the brushing. The bristles holders 10a and 10b may have, on their sides, one or more flexible segment 40 to aid the flexing of each holder during brushing. Although each bristles holder, 10a and 10b, of this embodiment carries continuous rows of bristles 30a and 30b, which, in their arrangements, follow the contours of the bristles holder 10a and 10b, it could be

arranged in separate groups or isles of bristles of the same or different shape, type, and distribution. Although bristles holders 10a and 10b of the brushing head 10 of this embodiment, has a rectangular geometry with rounded edges and tapered sides, it could have any other shape, geometry, or configuration. Also the bristles holders 10a and 10b could have different shapes and symmetry. Also, The handle 20, on the other hand, and its members 20a, which form an integral part with bristles holders 10a and 10b, could have any shape, geometry, and form other than that of the example shown in Figure 4.

The fourth embodiment of the present invention, which is shown in Figure 5, comprises four bristles holders 100a, 100b, 100c, and 100d, of the same or different geometry, and a handle 200, which is connected to the bristles holders 100a, 100b, 100c, and 100d, via four or more members 200a of the same or different geometry, which may include flexible structures or flexible segments 90, to allow flexing of the brushing head, as individual bristles holders or as a combined structure in the required directions during the brushing. Each bristles holder, 100a to 100d, of this embodiment carries continuous rows of bristles 300, which, in their arrangements, follow the contours of the bristles holder 100a, 100b, 100c, and 100d.

## CLAIMS

1. A toothbrush comprises upper and lower bristles holders, which are joined in one structure and have the same or different geometry and symmetry, and a handle.
2. A toothbrush according to claim 1 and in which the arrangement of bristles on the bristles holders follows the contour of these holders so that the bristles of the upper holder surround and accommodate the brushed teeth at the upper jaw, while the bristles of the lower holder surround and accommodate the segment of the opposite teeth on the lower jaw, when the brushing head is placed between the teeth of the upper and the lower jaw.
3. A toothbrush according to claim 1 and claim 2 and in which the bristles are arranged in continuous rows or in groups or isles of bristles of the same or different shape, type, and distribution, on each bristles holder.
4. A toothbrush according to claims 1 to 3 and in which the brushing head includes flexible segments or flexible joints to allow segments of the brushing head to flex and spring in the required directions during the brushing.
5. A toothbrush according to claims 1 to 4 and in which the upper bristles holder and the lower bristles holder are opened to each other via through-holes or through-slots, of any shape, number, and spacing, to allow water, toothpaste, or any other cleaning medium to pass between the two holders.
6. A toothbrush according to claims 1 to 5 and in which the brushing head has a rectangular geometry with rounded edges and tapered sides, and its bristles holders have semicircular configuration.
7. A toothbrush according to claims 1 to 6 and in which the brushing head have any other shape or geometry, and its bristles holders have any configuration.

8. A toothbrush according to above claims 1 to 7 and in which the handle of the brush has a straight flat geometry, and forms an integral part with the brushing head.
9. A toothbrush according to above claims 1 to 8 and in which the handle of the brush has any other shape, geometry, and form.
10. A toothbrush comprises an upper bristles holder and a lower bristles holder which are separated from each other, and have the same or different geometry and symmetry, and a handle, which is connected to the brushing head segments, via two or more flexible or rigid members.
11. A toothbrush according to claim 10 and in which the arrangement of bristles on the bristles holders, follows the contour of these holders so that the bristles of the upper holder surround and accommodate the brushed teeth at the upper jaw, while the bristles of the lower holder surround and accommodate the segment of the opposite teeth on the lower jaw, when the brushing head is placed between the teeth of the upper and the lower jaw.
12. A toothbrush according to claim 10 and claim 11 and in which the bristles are arranged in continuous rows.
13. A toothbrush according to claims 10 and claim 11 and in which the bristles are arranged in groups or isles of bristles of the same or different shape, type, and distribution, on each bristles holder.
14. A toothbrush according to claims 10 to 13 and in which the upper bristles holder and the lower bristles holder include through-holes or through-slots of any shape, number, and spacing, to allow water, toothpaste, or any other cleaning medium to pass between the two holders.
15. A toothbrush according to claims 10 to 14 and in which the handle of the brush has a straight flat geometry, and forms an integral part with the brushing head

16. A toothbrush according to claims 10 to 14 and in which the handle of the brush has any other shape, geometry, and form.
17. A toothbrush comprises a brushing head arrangement which has a right hand side bristles holder and a left hand side bristles holder of the same or different shape and symmetry, and a handle which is connected to the bristles holders via two or more members, which may include a flexible structure or a flexible segment, to allow the brushing head arrangement to flex and spring, as individual bristles holders or as a combined structure, in the required directions during the brushing.
18. A toothbrush according to claim 17 and in which the bristles holders have, on their sides, one or more flexible segment to aid the flexing of each holder during brushing.
19. A toothbrush according to claim 17 and claim 18 and in which each bristles holder carries continuous rows of bristles which, in their arrangements, follow the contours of the bristles holder and arranged in separate groups or isles of bristles of the same or different shape, type, and distribution.
20. A toothbrush according to claims 17 to 19 and in which bristles holders of the brushing head has a rectangular geometry with rounded edges and tapered sides.
21. A toothbrush according to claim 17 to 19 and in which bristles holders of the brushing head have any other shape, geometry, or configuration.
22. A toothbrush according to claims 17 to 21 and in which the handle of the brush and its members, which form an integral part with bristles holders, have any shape, geometry, and form.
23. A toothbrush comprises four bristles holders of the same or different geometry, and a handle which is connected to the bristles holders via four or more members of the same or different geometry, which may include flexible structures or flexible segments to allow flexing of the brushing head, as individual bristles holders or as a combined structure in the required directions during the brushing.



24. A toothbrush according to claim 23 and in which each bristles holder carries continuous rows of bristles, which, in their arrangements, follow the contours of the bristles holder.
25. A toothbrush as claimed in any preceding claim and in which the handle and the brushing head arrangement of the brush are made of plastics, rubber, wood, metal, ceramic, glass or made from a combination of these materials.
26. A toothbrush as claimed in any preceding claim and in which the handle of the brush is provided with soft touch segments or members.
27. A toothbrush substantially as hereinbefore particularly described and as illustrated in Figures 1, 1a, 1b and 2 of the accompanying drawings.
28. A toothbrush substantially as hereinbefore particularly described and as illustrated in Figures 3, 3a and 3b of the accompanying drawings.
29. A toothbrush substantially as hereinbefore particularly described and as illustrated in Figures 4 of the accompanying drawings.
30. A toothbrush substantially as hereinbefore particularly described and as illustrated in Figures 5 of the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0116347.6  
Claims searched: All

Examiner: Philip J Roe  
Date of search: 18 January 2002

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): A4K (KBC, KCA)

Int Cl (Ed.7): A46B 9/00, 9/04

Other: Online: WPI, EPODOC, JAPIO

### Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2192784 A	(MAK) Whole document, particularly Figures 1 & 4	1, 10, 17, 19 - 22
X, Y	GB 2169499 A	(BEINY & FRISCHMANN) Whole document, particularly Figure 5	X: 1, 10, 17, 19 - 22 Y: 10 & 11
Y	FR 1075171	(DARCISSAC) Particular Figures 1 & 2	10 & 11
X	US 5842249	(SATO) Whole document, particularly Figure 6	1 - 3 & 6 - 9
X	US 4757570	(HAEUSSER & WOLPALKA) Whole document, particularly Figure 2	1 - 4, 8 & 9

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